

Roaring River

Conservation Opportunity Area



Ozark
Highlands



Dolomite glades top the hills of Roaring River State Park.

Department of Natural Resources

In a snow-filled December of 1845, the first General Land Office land surveyors in the Roaring River area wrote “high, steep, and rocky Mountains are so Slippery that it is not possible to Travle over them without indangering ones life.” They left to find more gentle terrain, but before doing so recorded their observations of scattered oak woodlands and expansive grassy glades. True forests occurred only in the rich bottomland valleys.

Frequent, low-intensity fires shaped this glade and woodland landscape for thousands of years. Although local fires may sometimes have started from lightning strikes or human sources, they more often spread into

the Roaring River hills from nearby prairies and savannas. Glade and woodland plants and animals depend on fire management to maintain the open, sunny landscape they require. Until very recently, fire has been purposefully excluded, leading to dense second-growth forests and cedar thickets on former glades.

The cool, clear waters of Roaring River are currently revered for their trout fishing, but Roaring River Spring also offers a glimpse of the region’s underground features. The rapid movement of water between the surface and groundwater creates sinkholes, caves and springs throughout the Ozarks. Protecting water quality is integral to sustaining local fish and wildlife populations.

Roaring River Conservation Strategies

- Restore woodland and glade natural communities.
- Improve riparian forests, water quality and stream habitat.
- Protect caves and springs.
- Use outreach and education opportunities to highlight management activities.
- Eliminate unwanted invasive plants and animals (e.g. sercia lespedeza and tall fescue).
- Work with willing private landowners to protect and manage native plants and animals.
- Restore habitats for species of conservation concern.



John Logan, Missouri Department of Natural Resources

Roaring River Spring releases an average of 20.4 million gallons of cool, underground water each day. Water enters the ground from sinkholes only to resurface miles away at Roaring River.

Priority Research and Inventory Needs

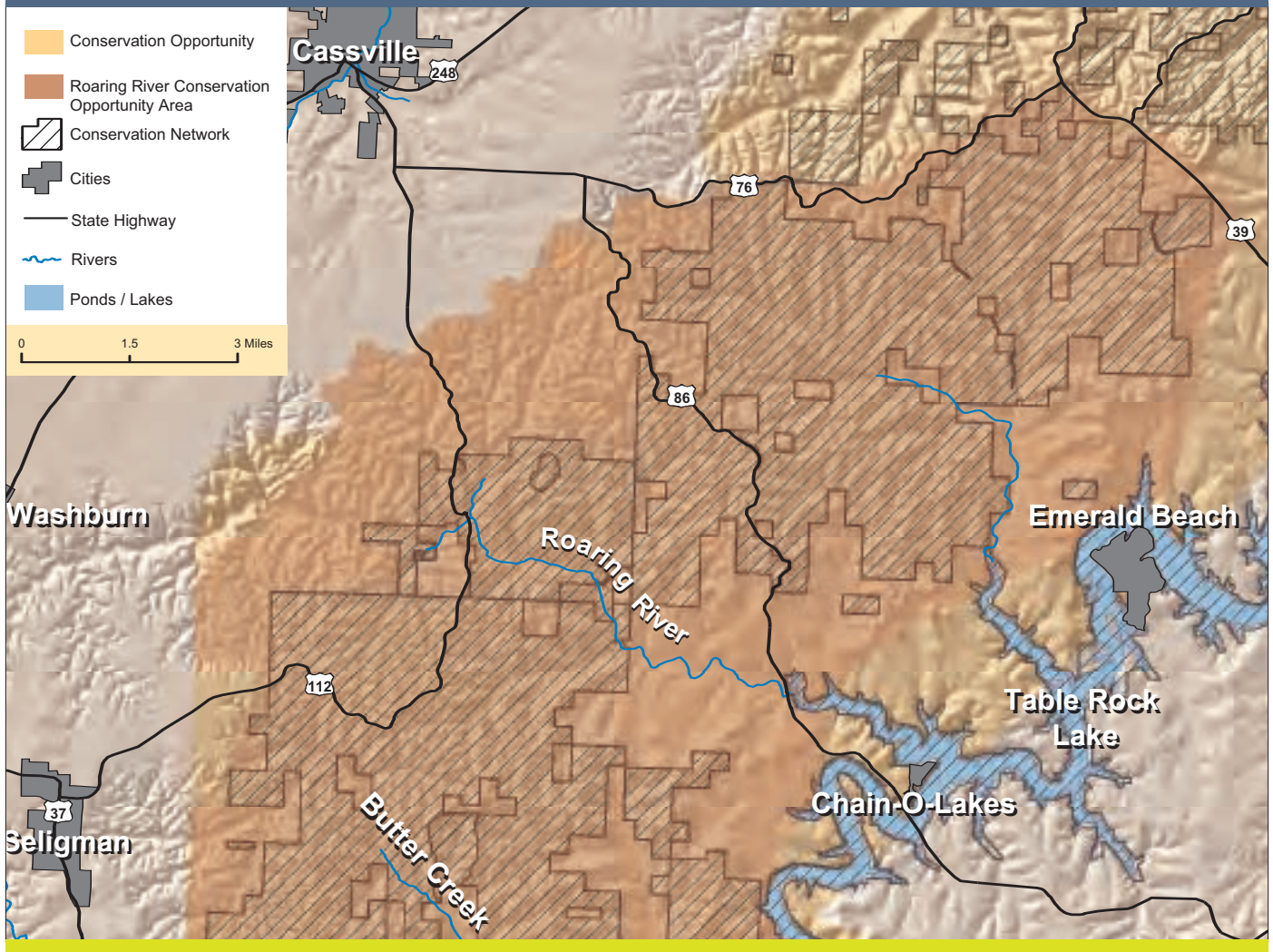
- Determine specific glade and woodland restoration sites.
- Identify locations to reduce and eliminate invasive plants and animals.
- Inventory species of conservation concern.
- Inventory aquatic plants and animals.
- Inventory caves and sinkholes.
- Delineate Roaring River Spring recharge area.
- Identify river and stream valleys that need reforestation.

Conservation Partners

Existing: Missouri Department of Natural Resources (DNR); Missouri Department of Conservation (MDC); U.S. Forest Service (USFS)

Potential: Audubon Missouri; Central Hardwoods Joint Venture; MAKO Fly Fishers; The Nature Conservancy – Missouri Chapter; Missouri Prairie Foundation; National Wild Turkey Federation (NWTF); Ozark Regional Land Trust; Sierra Club; Trout Unlimited; Missouri Conservation Heritage Foundation (MCHF); private landowners; U.S. Fish and Wildlife Service (USFWS); Natural Resources Conservation Service (NRCS)

Roaring River Conservation Opportunity Area



Funding Sources

Existing: USFS annual budget; DNR annual budget; MDC annual budget; MDC Private Lands Cost Share Program; NRCS Wildlife Habitat Incentive Program; NRCS Environmental Quality Incentives Program

Promising Future Sources: Farm Service Agency Conservation Reserve Program; USFWS Partners for Fish and Wildlife Program; USFWS Fish Passage Grants; MDC State Wildlife Grants; MDC Wildlife Diversity Funds; MDC Landowner Incentive Program; NWTF Wild Turkey Super Fund; MCHF Stream Stewardship Trust Fund; DNR 319 Grants

Eastern collared lizards (a species of conservation concern) require open, rocky glades for their survival. Thick groves of eastern red cedar now cover over 95% of collared lizard habitat in the Roaring River COA.

Existing Conservation Network

Mark Twain National Forest – Cassville District; (Butler Hollow Glades Natural Area); Roaring River State Park; (Roaring River Cove Hardwoods Natural Area); Roaring River Conservation Area



Jim Rathert,
Missouri Department
of Conservation

Glade Management



*The suppression of fires for more than 50 years has allowed cedars to grow large enough to survive prescribed burns. Often, **cedars must be manually removed** before fire can be effective.*

Cliff White, Missouri Department of Conservation

Conservation Challenges

The most significant threat to the Roaring River Conservation Opportunity Area remains the invasion of eastern red cedars. Other obstacles to success may include funding and staff

time shortages, differing agency management regulations, lack of understanding from the public and an inadequate market for selling small cedars.

To learn more about the Roaring River Conservation Opportunity Area, please contact:



Missouri Department of Conservation
Wildlife Division
P.O. Box 180
Jefferson City, MO 65102-0180

Roaring River

Conservation Opportunity Area

Glade and Woodland Restoration Initiative



Ozark
Highlands



Eastern Collared Lizard



Low Prickly Pear



Chuck-Will's Widow

Frequent, low-intensity fires shaped Roaring River's grassy glades and open woodlands. Fires likely occurred every three years prior to European settlement, but recent fire exclusion has led to dense second-growth forests and cedar thickets on former glades. Less than 5% of previous glade habitat remains open in the Roaring River landscape. Glade-associated wildlife including collared lizards, roadrunners, Bachman's sparrows and tarantulas have severely declined or disappeared. Removing cedar trees and reestablishing the grass and wildflower dominated hilltops is the only way to restore these animals to healthy populations. Approximately 12,000 acres of glade and woodland restoration potential exists within the project area (7,000 acres within the existing conservation network; 5,000 acres on privately owned land).

Glade. A natural, grassy opening in a woodland or forest; in Missouri, glades are usually located on hillsides and are a result of rock or soil conditions.

Woodland. A plant community with trees spaced to form an open canopy with a dense ground cover of sun-loving plants, including grasses.

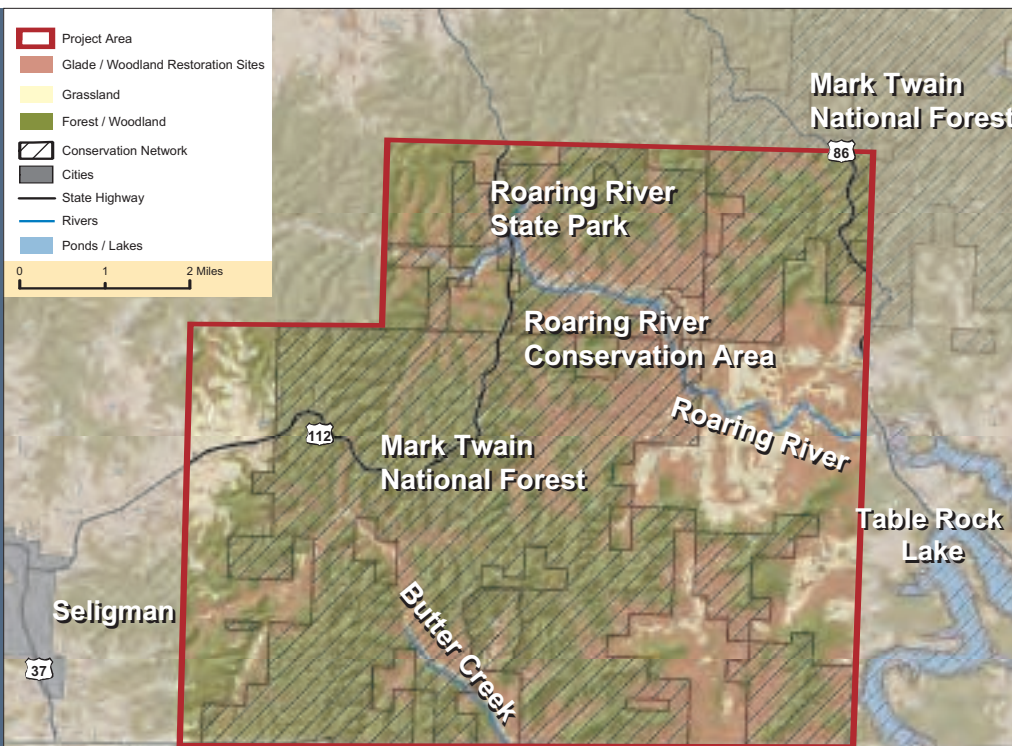
Landscape	Community	Species
Glade and woodland complexes	Dry chert woodlands, Dry limestone/dolomite woodlands, Dry-mesic chert woodlands	Three-toed Box Turtle, Smooth Earth Snake, Northern Fence Lizard, Whip-poor-will, Chuck-will's widow, Orchard Oriole, Great Crested Flycatcher, Summer Tanager
	Dolomite Glades	Pale Gerardia, Bush's Poppy Mallow, Marine Vine, Fremont's Leather Flower, Umbrella Plant, Stemless Evening Primrose, Low Prickly Pear, Stenosiphon, Ozark Spiderwort, Venus' Looking Glass, Ozark Corn Salad, Arkansas Yucca, Eastern Collared Lizard, Flat-headed Snake, Greater Roadrunner, Painted Bunting, Bachman's Sparrow



Summer Tanager

Strategic Conservation Goal:

Use prescribed burning and cedar tree removal as tools to improve 2,500 acres of glades and woodlands within the Roaring River Glades and Woodlands project area.



Desired Change	Proposed Monitoring
↓ Decreased number of acres dominated by Eastern Red Cedar	Periodic assessment of land cover using satellite imagery or aerial photography
↑ Increased populations of target animals	Population trend of eastern collared lizards at 3-year intervals
↑ Improved plant community composition in dolomite glades and woodlands	Vegetation sampling to detect changes in conservative glade plants at 3-year intervals
↑ Improved canopy structure of oaks and woodland hardwoods to 30-50%	Periodic assessment of land cover using satellite imagery or aerial photography
↑ Changed landscape character (more open areas with fewer trees; more grasses and sun-loving plants)	Land based photographs at 3-year intervals
↑ Increased natural community management on private land	Number of participating landowners; number of acres treated annually

To learn more about the Roaring River Glade and Woodland Restoration Initiative, please contact:



Missouri Department of Conservation
Wildlife Division
P.O. Box 180
Jefferson City, MO 65102-0180